| Notice of Allowability | Application No. 10/613,273 | Applicant(s) DENGLER ET AL | |
|---|---|---|---|
| | Examiner Eric Woods | Art Unit 2672 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--*

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Amendment filed 17 October 2005*.

2. ☒ The allowed claim(s) is/are *1-38*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   **Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

## DETAILED ACTION

## EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with James Singer (45,111) on Friday, January 20, 2006.

In the claims:

Please amend claims 1, 18, 22, 26, and 30 as follows.

**SEE ATTACHED.**

## REASONS FOR ALLOWANCE

The following is an examiner's statement of reasons for allowance:

The prior art does not particularly teach the use of a view model created with PTZF information in conjunction with the lack of use of image content information. Kreitman, Kennedy JR et al (US 2001/0031067)) teach the use of optical features to find various features and insert advertising. Kreitman tracks optical features as discussed in the previous office action. Moengen and Honey teach inserting and overlaying optical content in a scene without reference to three-dimensional location or position, etc.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

**NOTE**: James Singer **specifically** stated on the record that the term "**camera sensor data**" is to be interpreted such that it must include additional sensor data (pan, zoom, tilt, and/or focus information, as in Figure 1, as examples, orientation). This is an explicit disclaimer of claim scope that creates a prosecution history estoppel.

The best-applied prior art is given as it would be applied to claim 1. It is noted that the overall combination – with the limitation of training as defined in the instant specification in section 1C (as stated by attorney as being critical and as being the definition of training) – does not teaching training and/or a view modeler, where Kreitman is the closest available prior art. Therefore, this rejection was not used.

A method of placing content into an image sequence, comprising: (Preamble is not given patentable weight, since it only recites a summary of the claim and/or an intended use, and the process steps and/or apparatus components are capable of standing on their own; see Rowe v. Dror, 112 F.3d 473, 42 USPQ2d 1550 (Fed. Cir. 1997), Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165 (Fed. Cir. 1999), and the like.)

-Applying a transform function to visual content to be inserted into an image sequence; and (Moengen 1:40-2:2, the idea of applying a "comet tail" to an ice hockey puck. Note further the Abstract, where the concept of a synthetic track applied to an image is stated. This tracking is done specifically by determining the location of an object using

electromagnetic energy or the like (see the Foxtrax system, as discussed in 1:40-2:2)(specifically, note 3:35-4:64). Clearly, applying a "comet tail" or synthetic track would comprise "applying a transform function to visual content to be inserted into an image sequence, e.g. a television picture.")(Kreitman describes applying a transform function to visual content to be inserted into an image sequence (see Kreitman, Figs. 2, 4, and 7:64-8:9, wherein image 42 of Fig. 4 is transformed to match the perspective of the input video frame of Fig. 2 and is inserted into the video frame of Fig. 2))(Honey's patent is the FoxTrax system described in Moengen above. Honey tracks the location of the object and shows it with a comet tail on the screen as described above. Now, the system of Honey does apply a transform function to visual content, since the system automatically controls the camera so that it follows the object **using electromagnetic energy emitted by the puck**. Therefore, the camera is commanded to pan, scan, and rotate based on the determined position of the object. See Figure 7, where the camera has a PTZ (pan, tilt, and zoom) encoder that codes such information into the television signal. Furthermore, Honey clearly describes how the puck can be outlined or replaced with a different symbol. This is done entirely based (8:35-9:35) on the position of the puck and knowledge of the tilt, angle, etc of the camera based on the above sequence.)

-Blending the transformed visual content with the image sequence; (Moengen Abstract states that the synthetic object overlays the movable object and represents it in the television picture (e.g. like the "comet tail" used by Foxtrax and the like))(Kreitman clearly teaches blending the transformed visual content with the image sequence (see

Kreitman 6:26-37, Fig. 4C, and 8:1-9, wherein transformed blending mask 58 is utilized to blend the image 42 with the colors of the field on which the image 42 is implanted))

-Wherein the applying step and the blending step together result in insertion of the content into the image sequence such that the content appears at a target location as if it had been part of the original scene displayed by the image sequence; and (Kreitman 8:1-9, wherein if players walk on the part of the court 32 where the image 42 is implanted, they will appear to walk "over" the implanted image);

-Wherein the applying step comprises all geometric transformations of the visual content, is performed without reference to any content contained in the image sequence, is performed with reference to a model that resulted from training, and is performed without reference to any three-dimensional real world space locations or dimensions. (Kreitman, col. 7, line 64 to col. 8, line 6, wherein the transforming step performed by transformer 64 comprises all applied geometric transformations of the visual content)(Kreitman clearly utilizes a model as defined above; see 3:10-15 as an example.)(Moengen clearly does not utilize any three-dimensional real world space locations as defined by applicant's specification, e.g. with respect to the camera – such locations are merely defined with respect to the model of the scene (as in Kreitman)).

Moengen (and Honey) teach a system where various types of system track the location of various objects within a scene. These objects are tracking using non-visible energy (e.g. radar, infrared, or other types of electromagnetic energy in the case of honey). These various objects can be players or pucks or balls (11:8-44) as well as (15:24-60) objects within a race or other moving targets. The only requirement is that

such items have transponders on them. Now, Honey further teaches that the camera information (9:30-35) can be used along with the location information from the tracking sensors to find the location of the puck within a frame. Specifically, with multiple cameras and sensors, the location of puck is found using the invisible radiation method (e.g. IR or radar). Now, this can be done with various representations of the scene, such as taught by Moengen in (8:63-9:15, 12:32-13:35,13:55-14:55) and the like. Obviously, if the object is not visible but is obscured by something, the system would need to know where to insert the synthetic object, which would therefore require a model, which is suggested in (14:65-15:20) that representations of a physical space could be used, which clearly suggests a model.

However, Moengen (and Honey) do not expressly teach the use of a model as stated in the above claim. Kreitman, an analogous art, clearly teaches the use of a model generated before the actual event (as in by training or calibration). Now, that reference admittedly does not teach certain details of the claims (as noted in applicant's Remarks). However, Moengen clearly does at least contemplate the use of a model, and if Moengen overlays a track in a scene where the object is obscured by other items, it must prima facie be capable of utilizing a model.

Kreitman, as noted previously, also teaches that the object can be placed in any location on the model and that a mask is used to determine what part of it, if any, is visible. However, in place of using the visual method of determining whether or not an object is in the way of the model, the methods of Moengen and Honey could clearly be

used to determine the location of an object, such that no real-world coordinate data would be necessary to perform the steps of Kreitman.

Now, Kreitman does teach the use of a model created by a calibration or training process, where a model of the scene is created. Note that the instant claim does not state the model cannot be created using the camera or any other technique, only that the insertion uses a model created by training. Therefore, the teachings of Kreitman on how to create a model are quite relevant herein.

Therefore, since Moengen clearly contemplates having various objects tracked in a scene, where the objects could obscure each other and/or be obscured by objects in the scene, it would be obvious that utilizing a model to avoid occlusion problems between tracks or the like would be advantageous, as noted in Kreitman (1:60-2:45), where the utility of having a model and masking is pointed out. Obviously, the model of Kreitman would serve therein, along with the idea of masking the object shown in the model if it is occluded by another object, e.g. one of the transponders being tracked in Moengen / Honey.

Motivation for combination of Moengen and Honey is simply that Moengen cites Honey as relevant prior art and discusses various aspects of it. Also, Moengen is silent on whether or not the cameras transmit their PTZ data as set forth in Honey, which is necessary for the system to operate correctly without the use of coordinate information.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See 892 for citation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Woods whose telephone number is 571-272-7775. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 571-272-7664. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eric Woods January 20, 2006

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

**PROPOSED AMENDMENTS**

1. (Currently Amended) A method of placing content into an image sequence, comprising:

applying a transform function to visual content to be inserted into an image sequence; and

blending the transformed visual content with the image sequence;

wherein the applying step and the blending step together result in insertion of the content into the image sequence such that the content appears at a target location as if it had been part of the original scene displayed by the image sequence; and

wherein the applying step comprises all applied geometric transformations of the visual content, is performed without reference to any content contained in the image sequence, is performed with reference to a view model that resulted beforehand from training that used camera sensor data, and is performed without reference to any three dimensional real world space locations or dimensions.

18. (Currently Amended) A method of placing a virtual marker line into an image sequence, comprising:

applying a transform function to a marker line that is to be inserted into an image sequence that was produced by a camera; and

blending the transformed line with the image sequence;

wherein the applying step and the blending step together result in insertion of the line into the image sequence such that the line appears at a target location as if it had been part of the original scene displayed by the image sequence; and

wherein the applying step comprises all applied geometric transformations of the line, is performed without reference to any real-time content contained in the image sequence, is performed with reference to a view model that was defined beforehand in a setup phase that

included training using camera sensor data, and is performed without reference to any location of the camera.

22. (Currently Amended) A method of placing a virtual sign into an image sequence, comprising:

applying a transform function to a virtual sign that is to be placed into an image sequence that was produced by a camera; and

blending the transformed sign with the image sequence;

wherein the applying step and the blending step together result in insertion of the sign into the image sequence such that the sign appears at a target location as if it had been part of the original scene displayed by the image sequence; and

wherein the applying step comprises all applied geometric transformations of the sign, is performed without reference to any content contained in the image sequence, is performed with reference to a view model that was defined beforehand in a setup phase that included training using camera sensor data, and is performed without reference to location of the camera.

26. (Currently Amended) A method of placing content on a moving object in an image sequence, comprising:

applying a transform function to visual content to be inserted into an image sequence, wherein the image sequence includes a moving object; and

blending the transformed visual content with the image sequence;

wherein the applying step and the blending step together result in insertion of the content into the image sequence such that the content appears at a target location as if it had been part of

the original scene displayed by the image sequence, and such that the content is located on the moving object as the object moves in the scene; and

wherein the applying step comprises all applied geometric transformations of the visual content, is performed without reference to any content contained in the image sequence, is performed with reference to a view model that was defined beforehand in a setup phase that included training using camera sensor data, and is performed without reference to any three dimensional real world space locations or dimensions.

30. (Currently Amended) A method of inserting dynamically changing visual content into an image sequence, comprising:

applying a transform function to dynamically changing visual content; and

blending the transformed dynamically changing visual content with an image sequence;

wherein the applying step and the blending step together result in insertion of the content into the image sequence such that the dynamically changing visual content appears as if it had been part of the original scene displayed by the image sequence;

wherein said applying step comprises all applied geometric transformations of the dynamically changing visual content, is performed without reference to any real-time image content contained in the image sequence, is performed with reference to a view model that resulted beforehand from training that used camera sensor data, and is performed without reference to any three dimensional real world space locations as related to the image sequence.